

Name: \_\_\_\_\_

## at1118paper: Complete the Square (v401)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 60x = -611$$

Add  $\left(\frac{-60}{2}\right)^2$ , which equals 900, to both sides of the equation.

$$x^2 - 60x + 900 = 289$$

Factor the left side.

$$(x - 30)^2 = 289$$

Undo the squaring. We need to consider both  $\pm\sqrt{289}$ .

$$x - 30 = -17$$

or

$$x - 30 = 17$$

$$x = -47$$

or

$$x = -13$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 34x = -120$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 6x = 616$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 30x = -176$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 38x = -105$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 24x = -63$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = 203$$

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## at1118paper: Complete the Square (v402)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 32x = -240$$

Add  $\left(\frac{-32}{2}\right)^2$ , which equals 256, to both sides of the equation.

$$x^2 - 32x + 256 = 16$$

Factor the left side.

$$(x - 16)^2 = 16$$

Undo the squaring. We need to consider both  $\pm\sqrt{16}$ .

$$x - 16 = -4$$

$$x = -20$$

or

or

$$x - 16 = 4$$

$$x = -12$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 18x = -56$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = -667$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 12x = -35$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 40x = -375$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 42x = 2160$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 24x = -119$$

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## at1118paper: Complete the Square (v403)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 58x = -837$$

Add  $\left(\frac{-58}{2}\right)^2$ , which equals 841, to both sides of the equation.

$$x^2 - 58x + 841 = 4$$

Factor the left side.

$$(x - 29)^2 = 4$$

Undo the squaring. We need to consider both  $\pm\sqrt{4}$ .

$$\begin{aligned} x - 29 &= -2 \\ x &= -31 \end{aligned}$$

or  
or

$$\begin{aligned} x - 29 &= 2 \\ x &= -27 \end{aligned}$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 28x = 128$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 56x = -775$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = 441$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 50x = -429$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = 455$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 46x = -528$$

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## at1118paper: Complete the Square (v404)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 36x = -308$$

Add  $\left(\frac{-36}{2}\right)^2$ , which equals 324, to both sides of the equation.

$$x^2 - 36x + 324 = 16$$

Factor the left side.

$$(x - 18)^2 = 16$$

Undo the squaring. We need to consider both  $\pm\sqrt{16}$ .

$$x - 18 = -4$$

or

$$x - 18 = 4$$

$$x = -22$$

or

$$x = -14$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 20x = 429$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 24x = 585$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 48x = 1825$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 56x = 177$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 22x = 104$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 14x = 1107$$

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## at1118paper: Complete the Square (v405)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 54x = -720$$

Add  $\left(\frac{-54}{2}\right)^2$ , which equals 729, to both sides of the equation.

$$x^2 - 54x + 729 = 9$$

Factor the left side.

$$(x - 27)^2 = 9$$

Undo the squaring. We need to consider both  $\pm\sqrt{9}$ .

$$x - 27 = -3$$

or

$$x - 27 = 3$$

$$x = -30$$

or

$$x = -24$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 10x = -21$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 30x = 799$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 44x = 1197$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 24x = 112$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 42x = 1080$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 24x = 697$$

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## at1118paper: Complete the Square (v406)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 32x = -252$$

Add  $\left(\frac{-32}{2}\right)^2$ , which equals 256, to both sides of the equation.

$$x^2 - 32x + 256 = 4$$

Factor the left side.

$$(x - 16)^2 = 4$$

Undo the squaring. We need to consider both  $\pm\sqrt{4}$ .

$$x - 16 = -2$$

$$x = -18$$

or

or

$$x - 16 = 2$$

$$x = -14$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 28x = -187$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = 1088$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 6x = 475$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 24x = -95$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = 720$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 44x = -403$$

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### at1118paper: Complete the Square (v407)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 54x = -440$$

Add  $\left(\frac{-54}{2}\right)^2$ , which equals 729, to both sides of the equation.

$$x^2 - 54x + 729 = 289$$

Factor the left side.

$$(x - 27)^2 = 289$$

Undo the squaring. We need to consider both  $\pm\sqrt{289}$ .

$$x - 27 = -17$$

or

$$x - 27 = 17$$

$$x = -44$$

or

$$x = -10$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 56x = -159$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 6x = 616$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 18x = 1008$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 28x = 380$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 48x = 265$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 42x = 184$$

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## at1118paper: Complete the Square (v408)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 44x = -468$$

Add  $\left(\frac{-44}{2}\right)^2$ , which equals 484, to both sides of the equation.

$$x^2 - 44x + 484 = 16$$

Factor the left side.

$$(x - 22)^2 = 16$$

Undo the squaring. We need to consider both  $\pm\sqrt{16}$ .

$$x - 22 = -4$$

or

$$x - 22 = 4$$

$$x = -26$$

or

$$x = -18$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 6x = 775$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 46x = 2175$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 48x = 1188$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 42x = -425$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 28x = -192$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 56x = -703$$

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## at1118paper: Complete the Square (v409)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = -364$$

Add  $\left(\frac{-40}{2}\right)^2$ , which equals 400, to both sides of the equation.

$$x^2 - 40x + 400 = 36$$

Factor the left side.

$$(x - 20)^2 = 36$$

Undo the squaring. We need to consider both  $\pm\sqrt{36}$ .

$$x - 20 = -6$$

or

$$x - 20 = 6$$

$$x = -26$$

or

$$x = -14$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 22x = 840$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 8x = 128$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 36x = 1701$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 56x = -208$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 48x = -572$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 28x = 288$$

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### at1118paper: Complete the Square (v410)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 58x = -517$$

Add  $\left(\frac{-58}{2}\right)^2$ , which equals 841, to both sides of the equation.

$$x^2 - 58x + 841 = 324$$

Factor the left side.

$$(x - 29)^2 = 324$$

Undo the squaring. We need to consider both  $\pm\sqrt{324}$ .

$$x - 29 = -18$$

or

$$x - 29 = 18$$

$$x = -47$$

or

$$x = -11$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 40x = -399$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 50x = -609$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 20x = -84$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 46x = 560$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = 624$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 24x = 1300$$

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### at1118paper: Complete the Square (v411)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = -325$$

Add  $\left(\frac{-38}{2}\right)^2$ , which equals 361, to both sides of the equation.

$$x^2 - 38x + 361 = 36$$

Factor the left side.

$$(x - 19)^2 = 36$$

Undo the squaring. We need to consider both  $\pm\sqrt{36}$ .

$$x - 19 = -6$$

or

$$x - 19 = 6$$

$$x = -25$$

or

$$x = -13$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 34x = -240$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = -120$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = 624$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 40x = 384$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 10x = 200$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 36x = -275$$

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## at1118paper: Complete the Square (v412)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = -480$$

Add  $\left(\frac{-52}{2}\right)^2$ , which equals 676, to both sides of the equation.

$$x^2 - 52x + 676 = 196$$

Factor the left side.

$$(x - 26)^2 = 196$$

Undo the squaring. We need to consider both  $\pm\sqrt{196}$ .

$$x - 26 = -14$$

or

$$x - 26 = 14$$

$$x = -40$$

or

$$x = -12$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 32x = 105$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 20x = 189$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 6x = 216$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 26x = -153$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 56x = -780$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 36x = -323$$

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### at1118paper: Complete the Square (v413)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 30x = -209$$

Add  $\left(\frac{-30}{2}\right)^2$ , which equals 225, to both sides of the equation.

$$x^2 - 30x + 225 = 16$$

Factor the left side.

$$(x - 15)^2 = 16$$

Undo the squaring. We need to consider both  $\pm\sqrt{16}$ .

$$x - 15 = -4$$

$$x = -19$$

or

or

$$x - 15 = 4$$

$$x = -11$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = 215$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 36x = 1792$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 34x = 1475$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 32x = -247$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 10x = 144$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 50x = 336$$

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### at1118paper: Complete the Square (v414)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 56x = -780$$

Add  $\left(\frac{-56}{2}\right)^2$ , which equals 784, to both sides of the equation.

$$x^2 - 56x + 784 = 4$$

Factor the left side.

$$(x - 28)^2 = 4$$

Undo the squaring. We need to consider both  $\pm\sqrt{4}$ .

$$x - 28 = -2$$

$$x = -30$$

or

or

$$x - 28 = 2$$

$$x = -26$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 40x = -204$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 46x = 840$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 24x = -63$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = -240$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 8x = 84$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 58x = -792$$

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### at1118paper: Complete the Square (v415)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 26x = -153$$

Add  $\left(\frac{-26}{2}\right)^2$ , which equals 169, to both sides of the equation.

$$x^2 - 26x + 169 = 16$$

Factor the left side.

$$(x - 13)^2 = 16$$

Undo the squaring. We need to consider both  $\pm\sqrt{16}$ .

$$x - 13 = -4$$

$$x = -17$$

or

or

$$x - 13 = 4$$

$$x = -9$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = -396$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 44x = 2117$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 52x = -235$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 16x = -63$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 42x = -360$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 22x = -96$$

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### at1118paper: Complete the Square (v416)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 56x = -780$$

Add  $\left(\frac{-56}{2}\right)^2$ , which equals 784, to both sides of the equation.

$$x^2 - 56x + 784 = 4$$

Factor the left side.

$$(x - 28)^2 = 4$$

Undo the squaring. We need to consider both  $\pm\sqrt{4}$ .

$$x - 28 = -2$$

$$x = -30$$

or

or

$$x - 28 = 2$$

$$x = -26$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 34x = 936$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 24x = -119$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 18x = 760$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 8x = 384$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = -352$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 54x = 360$$

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### at1118paper: Complete the Square (v417)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = -312$$

Add  $\left(\frac{-38}{2}\right)^2$ , which equals 361, to both sides of the equation.

$$x^2 - 38x + 361 = 49$$

Factor the left side.

$$(x - 19)^2 = 49$$

Undo the squaring. We need to consider both  $\pm\sqrt{49}$ .

$$x - 19 = -7$$

or

$$x - 19 = 7$$

$$x = -26$$

or

$$x = -12$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = 413$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 48x = 448$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 38x = -192$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 10x = 231$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 - 18x = 280$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 22x = 104$$

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## at1118paper: Complete the Square (v418)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 60x = -644$$

Add  $\left(\frac{-60}{2}\right)^2$ , which equals 900, to both sides of the equation.

$$x^2 - 60x + 900 = 256$$

Factor the left side.

$$(x - 30)^2 = 256$$

Undo the squaring. We need to consider both  $\pm\sqrt{256}$ .

$$x - 30 = -16$$

or

$$x - 30 = 16$$

$$x = -46$$

or

$$x = -14$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 28x = -132$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 6x = 160$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 50x = -624$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 36x = -260$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 58x = -552$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 - 48x = -567$$

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### at1118paper: Complete the Square (v419)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 54x = -608$$

Add  $\left(\frac{-54}{2}\right)^2$ , which equals 729, to both sides of the equation.

$$x^2 - 54x + 729 = 121$$

Factor the left side.

$$(x - 27)^2 = 121$$

Undo the squaring. We need to consider both  $\pm\sqrt{121}$ .

$$x - 27 = -11$$

or

$$x - 27 = 11$$

$$x = -38$$

or

$$x = -16$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 42x = -392$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 8x = 308$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 + 54x = -725$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 + 10x = 0$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 52x = -651$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 38x = 264$$

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## at1118paper: Complete the Square (v420)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 60x = -576$$

Add  $\left(\frac{-60}{2}\right)^2$ , which equals 900, to both sides of the equation.

$$x^2 - 60x + 900 = 324$$

Factor the left side.

$$(x - 30)^2 = 324$$

Undo the squaring. We need to consider both  $\pm\sqrt{324}$ .

$$x - 30 = -18$$

or

$$x - 30 = 18$$

$$x = -48$$

or

$$x = -12$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 32x = -240$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 46x = -273$$

**Question 3**

By completing the square, find both solutions to the given equation:

$$x^2 - 46x = 627$$

**Question 4**

By completing the square, find both solutions to the given equation:

$$x^2 - 18x = 88$$

**Question 5**

By completing the square, find both solutions to the given equation:

$$x^2 + 18x = 1008$$

**Question 6**

By completing the square, find both solutions to the given equation:

$$x^2 + 30x = -104$$